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OCULAR MANIFESTATIONS OF SYPHILIS OF THE
CENTRAL NERVOUS SYSTEM.*

REPORT OF A CASE OF SYPHILITIC CEREBRO-SPINAL MENINGITIS.

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Before discussing the subject of this evening's paper it seems proper to refer, briefly, to the *aetiology* and *pathology* of syphilis in the light of modern research. I shall take the liberty of quoting F. W. Mott,¹ who says: "Through the discovery of Schaudinn and Hoffmann of the spirochæta pallida as the cause of syphilis and the important observations upon the biochemical changes in the fluids of the body by the Wasserman method of serum diagnosis a most valuable means of diagnosis of syphilis and parasyphilis has been obtained; as yet no vaccine has been successful but the outlook is not hopeless. The spirochæta pallida has been found in every possible lesion which is definitely syphilitic. In some cases they cannot be found in the primary sore unless a very careful search is made, and even then the search may not be successful. The same applies, with even more force, to the secondary eruptions."

The spirochætae have been discovered in the capillaries of the skin and in the perivascular tissue. Although only occasionally found in the blood, they are more numerous in the lymph and lymphatic organs in general; and, according to Metchnikoff, their presence in lymphatic vessels may be said to be constant in syphilis; it is at times possible to see a very large number in the

*Read at the June meeting of the St. Louis Ophthalmological Society.

perivascular spaces, although their number in the corresponding blood vessels may be exceedingly limited.

The organisms after local development at the point of inoculation in man and in the anthropoid ape soon reach the nearest lymphatic glands, where probably they again multiply in the lymph sinuses and spaces, setting up an adenitis; these changes may be biological, provoked by the organism for its perpetuation, and not, as taught, in the nature of a defense on the part of the tissues against the invasion by the organism. The living organism usually prevails and passes into the general lymph stream, causing polyadenitis and an infection of glands remote from the seat of inoculation. The organisms may thus find their way into the thoracic duct, and a general infection of the blood stream takes place, with the development of the secondary eruption (roseola). Moreover, a profound biochemical change occurs in the blood and fluids of the body. Occasionally, as first pointed out by Lang, and as I myself have observed in several cases, quite early in the disease, even before the primary sore is healed, symptoms pointing to meningitis may occur; also, the most severe and the most intractable cases of brain and spinal syphilis occur within the first twelve months after infection; it is quite probable that the meninges were infected at the time of the roseolar rash in some of these cases, but the symptoms occurring then were slight and overlooked. Not infrequently severe symptoms of meningitis have occurred within a few months of the primary sore. It is reasonable to suppose that if the spirochaeta is the cause of the secondary cutaneous eruption by a sort of metastatic process in the skin capillaries, that the same may occur in the meninges.

Microscopic examination shows that essentially the same tissue reactions occur in late manifestations of syphilis as in the primary or secondary stages.

It is well known that tertiary lesions are, as a rule, non-infective; consequently, we should not expect to find the active agent, or what we believe to be the active agent—spirochaeta pallida—except in a few instances, and then only in small numbers. This is actually what has occurred. For a long time attempts to prove the existence of the spirochaeta in tertiary lesions failed, and this led to the not unwarrantable view (which may be true) that the organism may exist in a latent and attenuated, possibly intracellular form, and it is possible that late manifestations may be the result in some cases of secondary lesions which have remained latent until raised into activity by some exciting factor,

such as exposure to cold, trauma, and toxæmia—microbal or otherwise. The spirocheta, however, has, in a few instances, been found in a gummatous tumor.

Just as there are, relatively, but few successful observations proving the existence of spirocheta in tertiary lesions, so there are, relatively few successful experiments of inoculation of animals from tertiary lesions. Hoffmann has, however, succeeded in inoculating an ape from a gumma occurring in a man three and a half years after primary infection.

Practically, the morbid tissue changes in syphilis are similar, whether the lesion be the primary sore or a gumma twenty years later; moreover, it is difficult to understand how the spirocheta, seeing that it has hardly ever been found in tertiary lesions, can produce the same specific cell hyperplasia so long after the primary infection. The following hypotheses may be put forward to explain the phenomenon of a gumma appearing spontaneously in the central nervous system long after the primary sore and apparent cure of the disease:—

(1) The spirochæta, or some modified form of it, has remained latent in the tissues at the seat of the lesion, and, for some reason, inherent or otherwise, the resistance of the tissues at that particular spot has become lowered, and the organism has exerted again its specific activity—possibly in some not yet discovered intracellular form.

(2) The specific organism has remained latent in some other tissue, the marrow of bone, the spleen or glands, and, escaping into the blood or lymph circulation, has, like a new growth, engendered a metastasis, which has developed and increased, producing a hyperplasia of the fixed tissue cell elements.

(3) There may be varieties of specific spirochætae, one of which may have an elective affinity for the central nervous system, as we know the *Trypanosoma Gambiense* has. It is difficult to differentiate this trypanosome from other forms by morphological appearances; how much more difficult would it be to differentiate varieties of spirochæta pallida.

(4) The invasion of the body by the spirochætae has altered the blood and lymph biochemically, so that the tissue reactions to all causes which would lead to injury may take on the specific character.

In the hands of nearly all trustworthy and experienced investigators the method introduced by Wasserman has yielded most valuable results as a means of diagnosis. It is claimed even that it is more reliable than the Widal reaction for typhoid. Plaut

obtained a positive reaction in 80 to 90 per cent. of undoubted cases of syphilis by this method. He found the reaction specific; it enables a diagnosis of the constitutional disease to be made but not of the organ affected. He did not obtain the reaction with the cerebro-spinal fluid in 25 cases of syphilis in which the nervous system was not affected, while the serum as a rule gave a positive reaction. It shows that the reaction depends upon the production of some substances by the tissues of the nervous system themselves. According to Plaut the reaction may be negative with the cerebrospinal fluid in cases of syphilis of the nervous system, but he obtained a positive result in 94 out of 95 cases of general paralysis with the cerebrospinal fluid, and in every one of the cases the serum gave a positive reaction. In cases of cerebral syphilis the serum was usually positive and the cerebrospinal fluid usually negative; in 70 to 80 per cent. of the cases of tabes the cerebrospinal fluid gave a positive reaction.

Levaditi, Ravaut and Yumanochi have proved that when syphilis leaves intact the central nervous system, although the serum gives a positive reaction the cerebrospinal fluid does not. It is, however, different when the central nervous system is affected even in a slight degree. The cerebrospinal fluid can then acquire properties which enable it to yield the Wassermann reaction. In fact, in the four cases of the many examined presenting nervous symptoms, which were neither tabetics nor paralytics, the fluid has twice given a positive reaction, although quite feeble."

While the nervous system is most frequently attacked in the late stages of syphilis, it is occasionally involved during the secondary stage, and Berkley² has found a local parenchymatous neuritis as a result of the changes in the initial lesion. Cases have been reported as having occurred as early as two months and as late as forty years after the infection. It is attacked in three ways:

- (1) New growths (gummata).
- (2) Chronic hyperplastic inflammation.
- (3) Inflammation of the vessels.

Gummata are most frequently found on the dura mater; on the convexity as well as at the base, appearing mostly as small tumors, and are generally near arteries. They are also found in the cerebrum, cerebellum, pons, medulla and spinal cord, and are generally accompanied by a localized meningitis or by inflamed vessels.

Syphilitic meningitis may be distributed rather evenly over the

convexity and basal portion of the brain, or it may be more or less localized.

The diffuse form, according to Nonne,³ is rather rare; the majority of the cases being localized and mostly basal. It is very seldom that the basal region escapes in syphilitic pachy and leptomeningitis. Favorite spots are in the region of the chiasm, the interpeduncular spaces and fossæ sylvii.

As a consequence the muscles of the eyes and the optic nerves are frequently involved.

While these tissues are the ones most frequently affected by basilar meningitis, the facial is also frequently involved; less often the trigeminus, still less frequently the acoustic and rarest of all the glossopharyngeal, vagus, accessorius and hypoglossus. While in the majority of cases the most of the basal portion of the brain is affected, the process sometimes affects only certain spots. Oppenheim⁴ reports a case where a small gumma involved a small portion of the middle part of the chiasm. He also cites cases where the trigeminus was affected by a gumma on the Gasserian ganglion.

While Nonne³ has never met with such cases, he thinks there can be no doubt that they do occur.

In basilar meningitis, not only the meninges and the nerves are affected, but the bloodvessels also.

A bloodvessel may be the seat of a gumma, it may be involved in the inflammatory process producing an endarteritis or phlebitis, or it may be compressed mechanically.

The nerves may be directly attacked by the syphilitic process; the products of the meningitis may compress them mechanically, or the nutrient vessels may be involved and carry poison to a nerve at a distance from the seat of the inflammation.

Meningitis of the convexity may involve the dura only, or the arachnoid and pia together, or all of them.

According to Charcot's⁴ experience the dura is more often involved in meningitis of the convexity and the arachnoid and pia mater in basilar meningitis.

The general symptoms of basilar meningitis, are very similar to those of meningitis of the convexity and to subacute and chronic brain disease in general. They include nausea, vomiting, polyuria, psychical disturbance and headache. Headache is frequently severe and is often associated with a severe pain back of the eyes. Optic neuritis and choked disc are more frequently the result of basilar meningitis than of the other syphilitic diseases of the brain.

The different cranial nerves may be separately involved. They may be isolated and involved on only one side but this is not the rule. Nonne³ says the rule is that nerves lying back of each other gradually become involved and that both sides of the base become affected. The inflammation may be diffuse or circumscribed. There may be primary or a secondary optic nerve disease. The secondary is the more common. The primary form is the result of the syphilitic process attacking the nerve direct without involving the meninges. This produces a descending neuritis regardless as to the location of the inflammation; whether it be the optic ganglia, the optic tract, the chiasm, or one of the optic nerves. In the majority of cases the seat of the trouble is in the optic nerve fibres or in the chiasm, and is the result of a gumma or of a gummatous meningitis. The nerve can also be injured by pressure from a meningitis. It also sometimes happens that the gummatous inflammation sets up an interstitial neuritis involving only a part of the optic nerve fibres, producing a secondary atrophy of the fibres attacked. At other times a total parenchymatous degeneration occurs. As a result when we have choked disc or atrophy they cannot be distinguished from those caused by a tumor or a sarcoma.¹ The general symptoms do not always enable us to make a differential diagnosis.

Thanks to Wassermann⁴ we can now determine as to whether syphilis is the cause or not. In doubtful cases it is wise to give a vigorous course of antisyphilitic treatment as cases have been reported by Saenger where great benefit has resulted where the tumor was later found to be non-syphilitic.

Nonne³ reports two cases of choked disc in young girls who gave absolutely no history of syphilis and he could discover no other symptoms. Under vigorous anti-syphilitic treatment the one recovered and the other sustained a partial atrophy. Choked disc is caused by gummatous meningo-encephalitis of the convexity, but much more frequently by basilar gummatous-encephalitis. As it is also caused by haemorrhage in the brain, abscess, albuminuria, diabetes, lukaemia and brain tumor, we can readily appreciate the importance and difficulty of making a differential diagnosis.

The picture of the descending neuritis differs from choked disc in that the papilla is not much swelled and the enlargement of the veins is slight. The retina is extensively involved, being cloudy and oedematous; haemorrhages and white plaques sometimes occur. It is always an inflammatory process and attacks the nerve either primarily or secondarily and is usually accom-

panied by other signs of cerebral syphilis. Alexander⁴ calls attention to the fact that we may have a combination of descending neuritis and choked disc. He says in typical cases of descending neuritis the sight is usually affected in a characteristic way. He is inclined to agree with Leber that in perineuritis the central vision is first disturbed because the peripheral fibres are first involved and these are the fibres that run to the macula lutea. In parenchymatous neuritis the central nerve fibres suffer first and the most; as they supply the periphery of the retina we find concentric contraction of the visual field with good central vision. Thus the effect on the vision depends on the nerve fibres that are involved. We may find all kinds of irregular contraction of the visual field, and peripheral and central scotomata. Until the inflammation reaches the disc there is naturally no ophthalmoscopic evidence of the descending neuritis. In such cases one must rely on permimetric tests to assist us in making a diagnosis. As it is possible to have choked disc and descending neuritis at the same time, we should always make careful permimetric tests. Nonne³ refers to a case of tabes, a parasyphilitic affection, occurring at the same time with a syphilitic affection of the optic nerve. Also a case of isolated syphilis of the spinal cord and syphilitic disease of the eyes including the optic nerves. Uthoff⁴ in 100 cases of brain syphilis observed by himself found double choked disc 4 times, optic neuritis 8 times, simple atrophy once. In 150 cases taken from literature he found choked disc 15 times, optic neuritis 7 times, simple atrophy 10 times. In only one case did he find a unilateral choked disc. He refers to the fact that choked disc sometimes disappears without leaving any ophthalmoscopic or functional disturbance; on the other hand, one nerve may recover completely and the other become atrophied. The sight may be quickly or slowly affected; first involving the central or the peripheral vision.

The loss of vision is usually partial and has a tendency to increase; the fields of vision are very variable.

Uthoff⁴ says he has seen only one case of double total blindness, and seven cases of one-sided total blindness.

Nonne³ says after brain syphilis has attacked the optic nerve, producing more or less disturbance of vision, it sometimes comes to a standstill as does tabes. The chiasm and the optic tract, according to Nonne, are more frequently affected by syphilis than the optic nerves. The chiasm is mostly primarily involved; from it the process extends forward to the optic nerves and back to the optic tracts. A study of the literature convinces him that the

chiasm is particularly liable to be affected by gummatous tumors. The ocular symptoms in these cases of course depend upon the location and extent of the syphilitic process. If the central portion of the chiasm is attacked we have bitemporal haemianopsia; disease of the lateral portions produces binasal, and involvement of an optic tract, homonymous haemianopsia.

Ophthalmoscopically we may find simple atrophy, descending neuritis or choked discs. Perimetric tests may show varied concentric contraction of the visual fields and various forms of scotomata. The vision may or may not be affected. Haemianopsia is a very frequent symptom of central syphilis. Uhthoff⁴ asserts that 10 per cent. of all cases of homonymous and 15 per cent. of temporal haemianopsia are the result of syphilis. He has had, in his experience, 11 cases of homonymous, 6 cases of bitemporal and no case of binasal. Out of 150 cases collected from literature he found only one case of binasal.

Concentric contraction of the visual field, he found 5 times, in his experience, and central scotoma 4 times. Alexander⁴ in his large experience has not seen a case of binasal haemianopsia, while Henschen⁴ has seen only one.

Paresis of the ocular muscles is a very frequent manifestation of central syphilis. Alfred Graefe⁴ believed that more than one-half of the cases of paresis of the ocular muscles are caused by syphilis; out of 269 cases Alexander⁴ found 53.5 per cent. due to syphilis, while Callus⁴ and Wilde found one-third of their 141 cases had a syphilitic history.

While involvement of one or more of the ocular muscles is usually accompanied by other symptoms we not rarely find an isolated paresis without other symptoms. While in the majority of cases paresis of the ocular muscles, especially the intraocular, are a late manifestation of syphilis, they often occur in the early stages. Wilbrand⁴ and Saenger report a case occurring 8 weeks after infection in a 30 year old man. In 167 cases of ocular paralysis Uhthoff⁴ found the oculo-motor involved 66 times, the abducens 29 and the trochlear 6 times. In 259 cases he found the oculo-motor affected 96 times. He says there is no disease that so frequently causes double, isolated total and partial paresis of these muscles as syphilis, and that double oculo-motor paresis is nearly as frequent as one-sided.

Alexander⁴ found 65 per cent. of ocular palsies due to syphilis to be oculo-motor; 33.5 per cent. were abducens palsies and 1.5 per cent. trochlearis. Elenoff⁴ says that oculo-motor involvement is next in frequency to that of the optic nerve while Kries⁴ says

three-fourths of the cases of ocular palsies due to syphilis are oculo-motor; total paralysis of this nerve as compared with partial is comparatively infrequent. Alexander⁴ found a total paralysis 19 times and a partial 145 times.

Nonne³ says that total paralysis of the oculo-motor without other functional disturbance of the cranial nerves is rare, in spite of the fact that Dineur reported 8 cases.

Much more frequently it is only partially involved or if the paresis is total, other cranial nerves are also affected. Uhthoff⁴ has pointed out that it is possible for a basilar meningitis to affect only the extra or the intra-ocular muscles; also that the whole nerve may be diseased without loss of function. Also that a gumma of the muscle itself may produce a paresis of the twig supplying it. Wilbrand⁴ and Saenger point out that an intra-orbital twig is sometimes the seat of a peri-neuritis, causing an isolated paresis. This, however, is rare. Nonne³ says it is at times secondarily involved with the optic nerve, trochlearis, abducens, and the first branch of the fifth by an inflammation in the orbital fissure, producing amaurosis, external and internal ophthalmoplegia, anaesthesia of the first branch of the fifth and eventually pain in the back of the orbit, oedema of the upper lids and slight exophthalmus. The stem of the oculo-motor may also suffer from a primary peri-neuritis and neuritis gummosa in which all or only a part of the nerve fibres are involved. Compression of the oculo-motor sometimes takes place as the result of syphilitic exostosis or gummatous growths. Saenger⁴ and Wilbrand report cases where a thrombus of one of the nerve vessels was responsible for the paresis. The most frequent cause of disease of the oculo-motor at the base is gummatous meningitis.

The nerves may be attacked by a gumma or by encephalitis; cases of the latter have been reported by Oppenheim⁴ and later by Wilbrand⁴ and Saenger who found the twigs of the nerve had undergone fatty degeneration and atrophy.

Nonne³ says the levator palpebra superioris is often the only ocular muscle affected by brain syphilis and of isolated paralyses this is the most frequent. Wilbrand⁴ and Saenger say no anatomical explanation for isolated ptosis has yet been found. Of the affections of the intra-ocular twigs, mydriasis, absence of pupillary reaction to light and convergence and paralysis of accommodation are the most frequent symptoms. In addition to this we frequently find a one-sided or double myosis with an iris that does not respond to light or convergence and the accommoda-

tion not affected. Like ptosis, these pupillary conditions may be the only symptoms of cerebral syphilis. In fact the pupillary phenomena may remain the only objective manifestation of the disease.

Uhthoff,⁴ in 100 cases of cerebral syphilis found 10 in which the pupils reacted to light but not to convergence. Absence of pupillary reaction to light and only to convergence he found 4 times in 100 cases. The cause for these symptoms he found to be mostly basilar meningitis and softening and gummata in the hemisphere. He found that these pupillary phenomena occur in about 14 per cent. of cerebral syphilis and in 60 to 90 per cent. of tabes. Nonne³ reports an interesting case of a syphilitic suffering from epilepsy, probably due to meningitis of the convexity, in which the pupils varied in size. One day the right was larger than the left; the next day the left was large and the right normal; the third day the right was larger than on the first day and the left was normal; the pupillary reactions were at all times normal. Under antisyphilitic treatment this disappeared in three weeks.

Mikloszewski calls attention to the fact that irregularity in the size of a pupil is not always a sign of organic disease of the nerves. He has obtained it twice in healthy persons, twice in functional neuralgia, four times in hysteria, twice in senile cachexia, once each in a case of nephritis, tuberculosis and rheumatism.

Alexander⁴ looks upon ophthalmoplegia interna as a quite frequent manifestation of syphilis. Out of 77 cases, 76 per cent. were in all probability syphilitic. He observed some of these cases develop tabes later on and in other cases it was a prodromal symptom of some disease of the nervous system, especially paralysis. Mooren found two-thirds of his cases due to syphilis, while Uhthoff⁴ found only 23.3 per cent. Nonne³ says that as a rule ophthalmoplegia interna as well as a combination of myosis, disturbance of the pupillary light reflex and the accommodation, are forerunners of a severe post syphilitic brain and spinal cord lesion; especially paralysis and tabes, which may not develop for long years after. In summing up the oculo-motor involvements, Nonne³ says we may have a paralysis of all of the outer and inner twigs, paralysis of all the outer twigs only, or all the inner twigs only; the outer muscles may suffer from an isolated paralysis or be involved together with various other muscles; of the inner muscles only the sphincter may be involved, or the accommodation may be affected; and again these may be

involved in different combinations with the exterior muscles either unilaterally or bilaterally. Of isolated paralyses, ptosis is the most frequent; isolated single or double mydriasis and single or double myosis with absence of light reflex are not infrequent ocular manifestations of brain syphilis. Further we frequently find a combination of paralysis of one of the extra ocular twigs of the oculo-motor in combination with paralysis of one of the twigs running to another extra-ocular muscle. Hutchison⁴ believed that all cases of partial and complete ophthalmoplegia externa were central; but Nonne³ says that autopsies he has made have so far shown mostly a peripheral involvement.

In 17 autopsies Uhthoff⁴ found the abducens affected 3 times. In 150 reported cases 17 were abducens; 6 bilateral and 21 unilateral. The causes were pons affections, syphilis at the base, and rarely neuritis and peri-neuritis of the nerve itself. In the cases of double abducens paralysis Uhthoff found basilar affections given as the cause. If the cause is intra-pontine the facial or the nerves supplying the contra lateral extremities will be affected.

Single abducens paralysis without involving the opposite facial or the nerve supplying the opposite side of the body is usually basal. In 17 autopsies Uhthoff found the trochlearis diseased only once and in this case there was a gummatous meningitis. In 150 reported autopsies the trochlearis was involved 6 times; basal gummatous meningitis was the cause. In no case was there an isolated paralysis. Pfunger,⁴ Nieden⁴ and Alexander,⁴ however, report cases of isolated paralysis of the trochlearis.

To differentiate between tabes and brain syphilis in some of these cases is difficult and sometimes impossible. Both diseases produce isolated paralyses, especially ptosis and pupillary disturbance, and both cause ophthalmoplegia externa. Tabes as well as syphilis sometimes causes ophthalmoplegia totalis, ophthalmoplegia externa complete and partial. In tabes, however, we frequently have the Argyll-Robertson pupil, (60 to 90 per cent. according to Uhthoff); in syphilis it is not so frequent. A thorough study of all symptoms, general as well as local, should be made. To differentiate between brain syphilis, tumor of the brain, multiple sclerosis, apoplexia cerebri, and tubercular meningitis is sometimes difficult and even impossible. It requires a thorough study of the general as well as the local symptoms.

Ptosis is sometimes met with as an isolated phenomenon in cortical affections. This is the only isolated paralysis caused by the higher centers, the intra-cerebral tracts (Fuchs). Other-

wise lesions of the higher centres cause conjugate paralysis. Conjugate paralysis is usually lateral, rarely up and down.

The following case has been under observation by Dr. Sidney I. Schwab and myself for the last four and one-half years. Feeling that it may be of some interest to this society I shall give you the ophthalmological findings and Dr. Schwab has very kindly consented to discuss it from the standpoint of the neurologist.

Mr. J. B., aged 32, consulted me January 2nd, 1906, giving the following history: For the last year has been suffering from headache, almost every day, in forehead and occiput, especially on the left side. For the last week it has been worse in the afternoon. Has had inflammation of the frontal sinus on the left side for about one year for which he is under treatment. He has no trouble with his eyes, but his rhinologist thought he might have some ametropia, which might be responsible for at least part of his headache.

Has always been well and vigorous with the above exceptions. Smokes and drinks excessively. Had gonorrhœa three times but denies every having had syphilis. His father, mother, three brothers, two sisters, and one son, aged seven, are all in good health.

St. Pr.—V. O.D. 17/15 w.+.25 D.S.=+.75 D.C. x 90=17/15.

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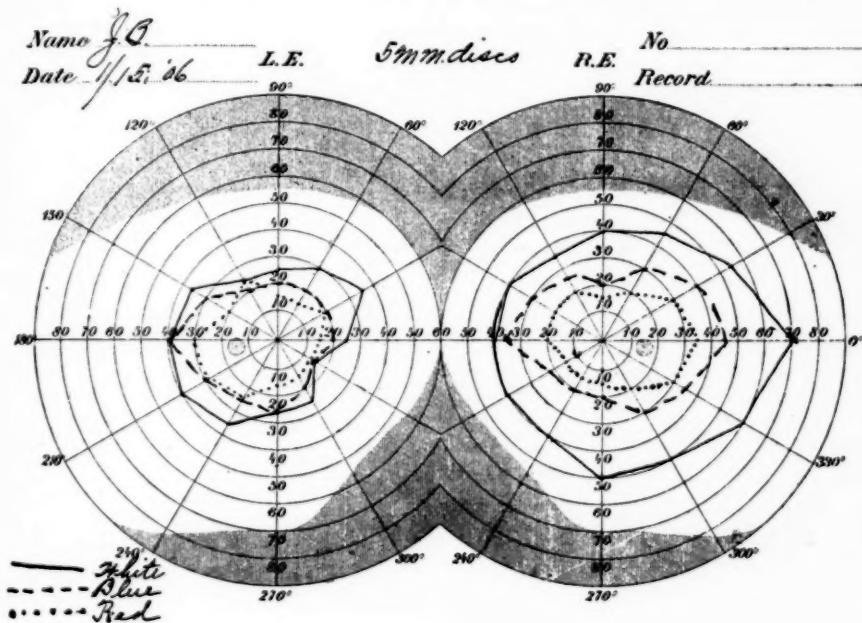
The pupils react somewhat sluggishly to light, but normally to accommodation, and are equal in size.

Abduction was 5 degrees, adduction 29 degrees, and there was one degree of esophoria. The ophthalmoscope revealed perfectly clear media and normal fundi with the exception of a slight pallor of the discs and a slight blurring of their edges. The entire disc had the color that is usually found in the average normal papilla on the temporal side. The arteries and veins were of normal size. The discs were just enough off color to arouse my suspicions and I made an appointment with him to take his fields the next day; at the same time I prescribed his astigmatic correction and advised him to wear the glasses constantly. He was unable to keep his appointment on account of business matters, and I did not see him again until January 15th, when he reported that for two days he had been seeing double, and that during the last ten days he had had a number of attacks of dizziness, lasting a few moments. A muscle test showed 20 degrees of esotropia, due to paresis of the right abducens, instead of 1 degree of esophoria two weeks before. His visual fields showed a decided

concentric contraction for white, blue, red and green, especially in the left eye. I referred him to Dr. Schwab who reported as follows:

January 15, 1906.—"There is no obvious mental defect. Patient appears intelligent and entirely normal; gives an intelligent account of his history; is perfectly oriented; is not depressed but is somewhat worried about his condition.

Pulse of 78; no evidence of arteriosclerosis in the radial artery; heart sounds are distant but perfectly clear; no accentuation of the second sounds; no enlargement of the heart; lungs normal. Urine shows specific gravity of 1022; no albumen and no sugar.



The gait is normal. There is a very slight swaying when the eyes are closed but not sufficient for a distinct Rombergism. There is some slight ataxia in the hands upon the performance of finer movements when the eyes are closed. There is marked tremor of the hands and tongue. There is parasthesia in the ulnar region of the hands and lower arms. In both these regions and elsewhere there is no objective abnormality. The reflexes show slightly plus in the knee jerks. The deep reflexes are all normal. The abdominals are present on both sides. The pupils react somewhat sluggishly to light, normal to accommodation, and are equal in size; consensual reaction is normal. The right

abducens is paretic. The rest of the cranial nerves are normal. A provisional diagnosis of cerebral syphilis was made and the patient was put upon intramuscular injections of benzoin of mercury followed by potassium iodid, 50 drops three times a day. Eighteen injections were given, at intervals of one to three days." I saw him again on March 31st, and he reported that his diplopia had disappeared and that his eyes were feeling good. The muscle test indicated 20 degrees of esotropia, as on January 15th.

He had obviously learned to suppress the image of his right eye.

I did not see him again until September 25th, when he reported that he had been getting along nicely until recently he had been feeling drowsy and had some tingling and numbness on his left side. No change in the condition of the right external rectus, but a right hyperphoria of 5 degrees had developed. I advised him to consult Dr. Schwab, which he neglected to do until May 11th, 1907. Dr. Schwab reported as follows:

"The patient disappeared from view until May 11th, 1907, almost a year, when he returned with the following history: About four days before May the 11th, 1907, he suddenly began to feel numb on the left side of his face, followed by a numbness of his left arm and left leg. His headache returned again with great intensity. Examination made at that time showed no abnormality, with the exception of a paresthesia in the left arm and hand. There was no objective evidence of a secondary disturbance. The knee jerks were still plus. The intra-muscular injections were repeated when the symptoms cleared up and the patient disappeared again."

On June 25th, 1907, I found the right external rectus acting quite normally; esophoria of $6\frac{1}{2}$ degrees, and no hyperphoria. October 15th, 1907, he called to have a cinder removed from his right upper lid and reported that he was feeling perfectly well; esophoria was found to be 2 degrees; no hyperphoria.

March 6th, 1908, he reported that he was having no trouble with his eyes, but that he was having some pain in his forehead and occiput. The fundi had not changed in appearance, and there was orthophoria. Advised him to see Dr. Schwab, which he neglected to do until May the 14th. Dr. Schwab reported as follows:

May 14, 1908.—"It was found that since the last examination the patient has had varying degrees of good health and bad. For a time he was under treatment with electricity administered by a surgeon. After that he was advised to take a long vacation

in the West. This he did. While out west he had several attacks of vertigo with a temporary paralysis of the right side. The diagnosis of a beginning paresis was made at that time. The attacks of paralysis were very brief in duration and seemed to have cleared up without any special treatment. After his return from the west he placed himself under a physical culture specialist where exercise, massage and other manipulative treatment was given him. About two weeks ago he began to have some difficulty in walking; staggering very much. About 1 week ago he had so severe an attack of vertigo and vomiting that he was compelled to get to bed where he has been for one week. He has been vomiting two or three times a day ever since. Cannot raise his head from the bed without bringing on an attack of vertigo. He can walk with difficulty; staggering about like a drunken man. His vomiting is unaccompanied by any feeling of nausea. He turns pale during the attack. At times feels nauseated without vomiting. Has headache though not especially severe. Neurological examination shows increased knee jerk on both sides and achilles more lively on the left than the right; no abnormal deep reflexes. Conjunctival anaesthesia marked on both sides. Sensory examination. No constant change from the normal in general sensation. No examination of gait or posture made on account of the vertigo, vomiting, etc.

Daily inunctions of vasogen mercury were ordered.

May 17, 1908.—No special change. The mental state showed some evidence of increasing stupor at times. Likewise there is some amnesia. Retained most of the food taken. Examination shows no special change in the reflexes. The nurse reports some twitching of the facial muscles and the right arm. The patient complains of parasthesia on the left side.

May 19, 1908.—Considerable vomiting and vertigo all day. The pulse at times showed some irregularity. His temperature is normal. Appetite is good but unable to retain more than one meal a day.

May 20, 1908.—Reflexes showed no change. There is now a suggestion of a clonus and Babinski on the right leg. Slight convulsive twitchings of the hand and arm observed. The mental state shows a tendency to wander; amnesia rather pronounced at times.

May 21, 1908.—The vertigo is still pronounced and the vomiting and nausea are present. Altogether the condition is not so good as the day before. During the night there was considerable restlessness and a mild degree of delirium. About 6:00

o'clock in the morning the nurse found the patient in a state of semi-stupor with slight clonic convulsions in different parts of the body. This lasted only a few moments. The pulse during this attack became very irregular and weak and dicrotic. After the attack the pulse became better. Deep hypodermic of Suc. hy. 15/16 gra. was administered. The headache is still very constant.

May 22, 1908.—No special change can be observed. The vomiting has seemed rather less; though the vertigo is about the same. Headaches are very constant though not of a severe type. It is impossible for the patient to raise his head in bed and the gait is staggering in the extreme. There are periods when he seems to be in a mild delirium with some evidence of hallucinations. Though this latter is not very definite. The clonic convulsions still keep up though they are rather less severe in type and are not constant.

There was considerable precordial pain. Examination showed nothing abnormal. Both heart sounds at the apex seemed somewhat weak though not sufficient to suggest a myocarditis. The deep injections of succinumate of mercury were kept up daily.

May 24, 1908.—The patient now begins to show definite signs of improvement. The headache has left him entirely and the vertigo has practically disappeared. He feels much better in every way and has a good appetite. The ankle clonus shows a definite decrease in length and force of movement. The knee jerk is about the same. The Babinski is doubtful.

May 25, 1908.—The improvement still continues. The patient was permitted to sit up for the first time. After he was up for about ten minutes he suddenly began to see double. This disappeared completely after the patient was allowed to rest.

May 27, 1908.—Two days ago evidence of stomatitis showed themselves. For this reason the deep injections were discontinued and the iodid kept up. The clonus has almost completely disappeared. The condition of the patient is very good in other respects.

May 29, 1908.—The improvement in the general condition continues. Deep injections were resumed.

June 1, 1908.—The patient is allowed to get up and move around. The gait is somewhat uncertain with still a tendency to weakness in the left leg.

June 5, 1908.—The injections reduced to two or three a week.

June 10, 1908.—Injection given at the office. Examination of the left leg still shows marked ankle clonus with a slight Babin-

ski obtained at times. The knee jerk is lively. There does not seem to be any spasticity. There is nothing abnormal to be observed in the gait. The patient looks very well.

June 12, 1908.—An examination made to-day shows that the ankle clonus has completely disappeared. There is no Babinski. Patient is in excellent health."

I saw him on May 15th, and found no change in the appearance of the optic discs. On the 22nd, a very different condition was found. The discs which previously had been pale, were now red and edematous; the edges could not be seen. The veins were tortuous and twice the size of the arteries, and the retina also had an edematous appearance, but there were no haemorrhages. The picture was that of a begining choked disc.

On the 27th, the discs and the retina were less edematous, the veins less tortuous and the edges of the discs could be faintly seen.

On June 10th, there was further improvement. The edges of the discs were plainly visible and the discs much less inflamed.

July 17th, the papillitis had disappeared.

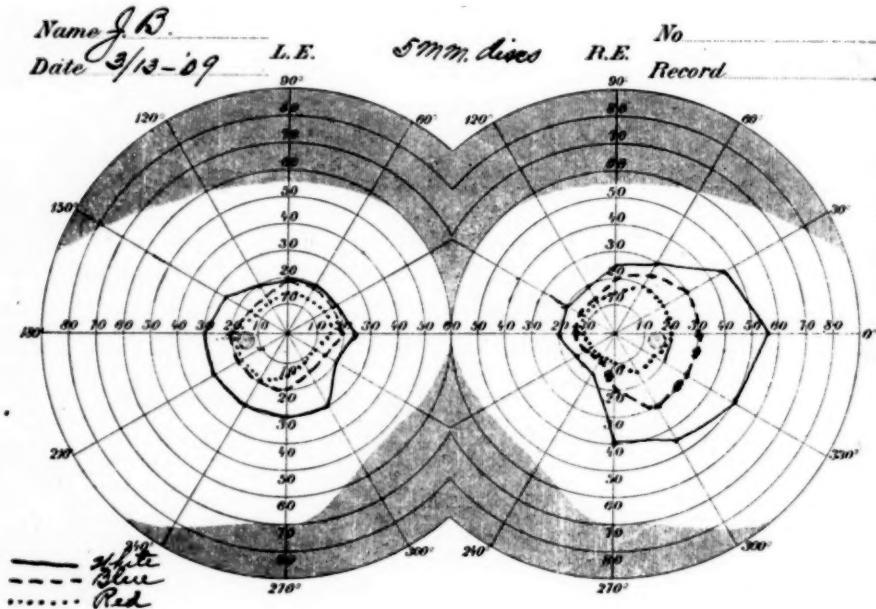
On September 13th, he was again seen by Dr. Schwab, who reported that "During this interval patient has been fairly free from symptoms of consequence. He had two attacks of vomiting in the morning after breakfast. There was no other symptom connected with the attacks. He had had no headache nor attacks of vertigo. He has been working regularly and hard at his business and during business hours he seems at his best. When he returns home in the evening he seems tired out and irritable. He has still a fear of the street car and has given up horseback riding on account of the difficulty in keeping the left leg in the stirrup. The parasthesia in the legs has disappeared.

October 7, 1908.—Patient returns with a complaint that his leg seems to be giving way. Upon examination the left leg seems to be spastic. There is some ankle clonus; Babinski is present; the achilles and knee jerk are pathologically plus. Upon walking there is a tendency to turn inwards with the left foot everted. Patient complains of chilly sensations. Otherwise seems very well. There is no headache and no vomiting.

October 26, 1908.—Patient presents himself with complaints which are largely mental in character. He has begun to worry about himself and his business affairs. Does not know just what to do with himself. He is restless and disturbed about trifles which have before not been noticed by him. Has no headache.

He missed his work on several days which is very unusual for him. He did not feel particularly badly but seemed indifferent to his work. Complains that he has lost all his ambition and interest. He is sleeping very well. He wakes up early in the morning and begins to worry. He passed through this period of temporary depression and it is noted on November 22nd, that his weight is 150 pounds, a gain of 9 pounds over last weight, about 2 months ago.

March 6, 1909.—He presented himself with the report that since March the second he noticed that his vision seemed blurred. Wore his glasses for a few days and seemed to feel better."



On March 13th, 1909, he consulted me and I found that his discs were both rather more pale than when I first examined him. The edges of the discs were fuzzy, and the vessels practically normal in size. The fields were taken and showed further concentric contraction.

March 22, Dr. Schwab says: "Patient vomited this morning. Had a bad night on account of headache. Complains of some blurring of vision."

March 27, 1909.—The patient in walking from the hotel became rather suddenly unable to walk; the legs seemed to give way under him and he fell to the ground. He was assisted to an

upright position and when nearing the hotel again he was seen to stumble as before. He managed to get to his room where he was seen after supper. He was lying on the couch and complained that he saw double. He was apparently in good condition otherwise; his mind seemed perfectly clear, was able to give an account of the accident and seemed in every way perfectly normal. March 28th, another ophthalmoscopic examination was made but no special change was noticed.

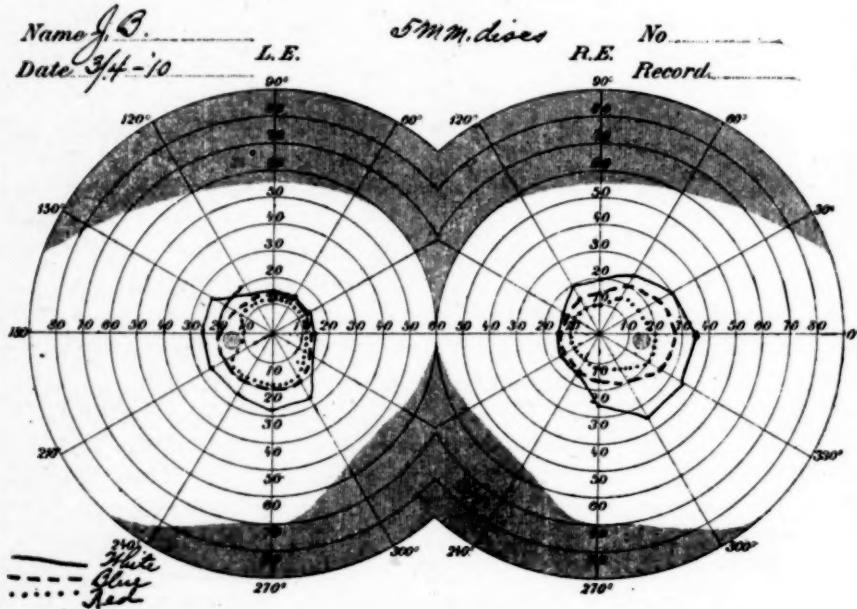
The patient had perfect control over his muscles in performing all the ordinary movements. He appeared to be slightly uncertain in standing but not more so than at previous examinations. His wife reported that he seemed rather childish and that his memory was not nearly so good as before. Hypodermics of mercury were immediately begun and the disturbance in the gait seemed to disappear. There is noticeable from time to time a return of the childishness mentioned by his wife and a slight deficiency in the movement of the left facial. His speech appears at times to be a bit uncertain though this is not absolutely certain. An examination of the reflexes made both at the first examination, and subsequently, revealed nothing new. The left leg showed the clonus and Babinski that it has from time to time shown.

April 1, 1909.—The gait is spastic and somewhat uncertain, especially in turning corners and in making sudden movements. The left leg shows the greater amount of spasticity. There is no disturbance in sensation. Both knee jerks are increased, the left more than the right. Left shows clonus, Babinski, plus achillis, plus plantar; the right shows plus plantar, but no clonus and Babinski. Oppenheim and Gordon are not present in either side. The abdominal reflexes are both present and equal; the cremasteric equal on both sides but not increased. There is fairly outspoken Rombergism.

April 3, 1909.—Patient feels better, walks steadier, has been down to business."

May 4, 1909.—At 6:00 P.M. the patient's wife telephoned that he had had a sudden convulsive attack while playing solitaire, and that blood escaped from his mouth. The patient was seen about fifteen minutes afterwards when he was found to be in bed, somewhat dazed but otherwise apparently normal. A description of the attack obtained from the wife and from the patient was something as follows: He had returned from business feeling apparently well and was playing solitaire when he suddenly became unconscious. His right arm dropped as if paralyzed and

blood escaped from the corners of his mouth. An examination showed an abrasion on the tongue on the right side. Physical examination made immediately after the attack revealed nothing new. The patient seemed to be amnestic for events that took place from about noon up to the time of the attack, but he gradually was able to remember the events serially after that happened. The next day the patient was seen and was apparently in his usual condition though he had a tendency to drag his right leg. He complained also of some pain in the right thigh. The patient's wife had noticed that he seemed a bit foolish at times, that he acts in a rather silly and foolish way, that he



seems quite unaware of the seriousness of his attack and that he seems disinclined to keep on with the treatment.

On March 2nd, 1910, he reported that he had been getting along nicely until one week ago, when his vision became blurred. Says he sees better if he closes one eye; sees double at times. A muscle test revealed 11 degrees of left hyperphoria; no esophoria or exophoria; vision normal. Has a slight ptosis on right side. The ophthalmoscopic picture was about that of a year ago. The visual fields were again taken and revealed a further concentric contraction. He was referred to Dr. Schwab whom he saw on March 10th. Dr. Schwab reported as follows:

March 10, 1910.—"In this interval, patient has been feeling very well, doing his regular business tasks with vigor and pleasure. He has gained his normal weight and strength, has completely recovered from his former depression; sleeps well and appears to have regained practically all his former business ability. For the past two weeks or so, his wife has noticed some unsteadiness in his gait and restlessness in sleep. Patient was put on another series of injections of succinumate of mercury.

April 6, 1910.—When the patient was stepping from a car to the Jefferson Hotel he suddenly felt a numbness in his right arm and limb. For about 30 seconds he was unable to move his arm and leg and then staggered. After a moment he recovered sufficiently to walk into the dining room, though the numbness persisted for about 10 minutes. Patient did not lose consciousness and had no convulsions. From this date up to the present, patient has been under fairly constant observation. No noticeable change of the patient's condition except his enormous gain in weight. His abdomen and lower part of the body shows tremendously large deposits of fat; so much so that it seems pathological. He is passing large quantities of urine; drinks tremendous large quantities of water and eats very much. Examination on several occasions, shows a light colored urine, of low specific gravity, containing no albumen, no sugar and no microscopic elements. Physical examination shows nothing out of the way with the exception of a somewhat rapid pulse and feeble heart sounds. Referred to Dr. Meyer for further examination and opinion. Examination of the urine, blood, etc., was made; beyond the enormous quantity of urine passed and the lower specific gravity, nothing was found. Question of diagnosis at present seems to incline towards diabetis insipidus, with the possibility of some central lesion as a cause for the tremendous increase in weight and the enormous output of urine."

The headache from which this patient suffered for about one year before coming under observation was probably due to a basilar meningitis which had during this time also produced a descending optic neuritis involving the central fibres of both nerves, as evidenced by the concentric contraction of both visual fields. The reason for looking upon the existing optic atrophy as secondary to a neuritis and not primary, is because of the blurred, fuzzy edges of both discs.

The paresis of the abducens which first called attention to the true nature of his trouble may, of course, have been due to involvement of the nerve nucleus or to involvement of the nerve

anywhere in its course; probably where it pierces the dura mater on the basilar surface of the sphenoid bone or as it passes through the sphenoidal fissure. As the inferior rectus was later somewhat involved and as the inferior division of the oculo-motor passes through the sphenoidal fissure just above the sixth this may have been the location of the trouble.

On May 27th, 1908, when the ophthalmoscope revealed red and somewhat swollen discs together with tortuous retinal veins and an oedematous condition of the retina, we undoubtedly had to deal with choked discs in the early stage, which were promptly relieved by the intra-muscular injections of mercury.

As a result of this attack the optic nerve atrophy was somewhat increased as shown by a further contraction of the visual fields. The 11 degrees of left hyperphoria which he showed on March 2nd, 1910, together with a slight ptosis on the right side, is, of course, due to a slight involvement of the superior division of the oculo-motor, probably in the region of the sphenoidal fissure. The recent marked increase in weight suggests a possible involvement of the pituitary body.

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THE VALUE OF DIONIN TREATMENT IN EYE DISEASES.

Adam (*Münchener Medizinische Wochenschrift*, February 15, 1910) discusses dionin as an analgesic and resorbent. As an analgesic he has the following to say for it: 1, It fails in twenty-five per cent. of all cases; 2, in the cases in which it works well at first habituation is easily induced which cannot always be overcome by an increase of the dose; 3, it frequently causes a severe burning; this may be avoided by the instillation of two or three drops of a ten per cent. solution of novocain ten minutes before its use; 4, in the cases in which it is effective it acts through a marked chemosis, so it can be used in ambulant practice only to a restricted degree. As regards its resorbent action he states that results show less efficiency than was expected from the results of animal experimentation, and that the resorption obtained is no greater than that obtained by older methods, or from nature.

DIONIN IN CORNEAL OPACITIES.

REPORT OF A CASE WITH REMARKABLE RESTORATION OF VISION.

BY SAMUEL HORTON BROWN, M.D.,
PHILADELPHIA.

Since the preparation known as dionin (ethylmorphin hydrochlorid) was first introduced into ophthalmic therapeutics by Darier as early as 1900, very remarkable effects have followed its use. While it was first used as an analgesic in painful affections of the anterior segment of the eye with very gratifying results, it was also found to be most efficacious in infiltrations of the cornea from one cause or another, and especially valuable in interstitial keratitis. As the use of the preparation became more popular, reports poured in from all sources regarding its several properties and scarcely an ophthalmologist in the world resisted the opportunity to make some contribution concerning the same. This resulted in the collective observation that the drug was of great value in clearing up recent opacities of the cornea and of greatly influencing opacities of more or less remote origin, in addition to its undisputed property of lessening pain in affections of the anterior segment of the eye.

The reckless manner in which the preparation was studied by some of the workers in this field tended to attribute to the drug properties of a most remarkable character which on careful study were shown not to exist. This in a manner cast some discredit upon the drug. However, the consensus of opinion at the present writing is that it is of great value as an analgesic in ocular affections and of doubtful value in the clearing of corneal opacities. Its judicious use is certain to be followed by good results. It is commonly used in a five per cent. aqueous solution but may be used in powder or ointment form. Those unfamiliar with its action will be very much surprised to note the intense congestion and edema of the conjunctiva that immediately follows its use and lasts about forty minutes. After several days' use, this phenomenon grows less and less pronounced and gradually ceases altogether.

As already mentioned, the use of dionin is quite commonplace and the results following its employment are well-known but it is the purpose of this paper to merely record a truly gratifying effect after a long period of markedly reduced vision. It illustrates the necessity of persistence in the treatment of individual cases.

The patient in this instance was a young woman about 28 years of age who had been a patient in the Wills Hospital for an inflammation of the cornea when she was about ten years old. After a rather lengthy sojourn she was discharged and glasses were ordered to correct the deficiency in vision. These were not entirely satisfactory, and after a few years, in despair, she consulted several oculists and opticians and eventually obtained lenses that afforded her comparative relief. These proved to be crossed cylinders.

At the time she consulted me she had been suffering from intense headaches for several months, and was certain that her sight was diminishing. This was 18 years after the original corneal trouble. She had reported at the Wills Hospital a day or two before, but after a very careful examination she was informed the only relief which could be offered her would be in a change of glasses. When she first presented herself to me, both eyes were found to be the sites of pronounced, apparently superficial opacities of the cornea, the right being involved to a greater extent than the left. The other media were clear and the fundi normal. One drop of a five per cent. solution of dionin was prescribed to be instilled twice daily in the right eye, the worse eye, for a period of ten days. At the end of this period the vision was found to be R. 5/22.5, L. 5/60. At the end of another month of the same treatment the vision was R. 5/12, L. 5/45. The dionin was discontinued in the right eye and employed in the left eye twice daily. At the end of two weeks the vision was R. 5/12? L. 5/20. Two weeks later the vision was 5/9? 5/9? and has remained so ever since.

Comparing this result with the original vision and taking into consideration the duration of these opacities without any attempts being made to resorb them, the course of the condition under treatment is very remarkable. The vision will probably be further enhanced by the wearing of correcting lenses.

REMARKABLE OPERATIVE CASES.*

BY DR. SCHULTZ-ZEHDEN,
BERLIN, GERMANY.

Translated by Adolf Alt, M.D.

I should like first to present two cases of most severe eye injuries in which I succeeded not only in saving the eye, but even a considerable amount of vision.

1. *Perforating injury. Piece of stone in the vitreous body. Extraction with preservation of vision.*

The patient was injured while blasting stone. The shot had exploded too soon and the whole charge of powder flew into his face. He was bandaged and brought to my clinic the same day. The whole face was coal-black and showed several skin wounds.

The eyes showed the following: Both corneæ, conjunctivæ and sclerotics were studded with powder grains. The right eye was badly injured. In the upper part of the cornea there was a perforating wound from which iris protruded. The anterior chamber was empty, the lens in toto opaque.

I at once cut off the prolapse, removed the powder grain from the cornea and introduced iodoform into the anterior chamber through the perforating wound. A few days later I removed the traumatic cataract by a corneal incision from the badly inflamed eye. Of course, from the perforating wound and the cataract I was convinced that a foreign body had entered the interior of the eye. An examination of the eye with the sideroscope gave no motion of the needle. If a foreign body had entered the eye its nature must differ from iron. As I was sure of the presence of a foreign body, it was necessarily my aim to get as soon as possible a view of the interior of the eye with the ophthalmoscope. Therefore I made as soon as possible a paracentesis of the cornea to remove the remnants of cortex which had remained behind. But even after this third operation it was not yet possible to get a view of the interior since the pupil was closed by a thick scar formation which adhered to the iris. I, therefore, made another corneal incision and with de Wecker's scissors cut through the pupillary membrane and the sphincter of the pupil. After this operation a view of the interior was obtained and a movable foreign body could be seen by focal illumination as well

**Berliner Klin. Wochenschrift*, April 25, 1910.

as with the ophthalmoscope lying in the vitreous body. In a prone position with hanging head the foreign body moved toward the upper part of the eye and remained here rather steadily if the patient kept quiet. This gave me a basis for my operative procedure in order to extract the foreign substance. I made an iridectomy downwards. I intended to enter through the iridectomy wound with straight forceps and to extract the foreign body from the vitreous body. The restlessness of the patient prompted me, however, to be satisfied with the iridectomy and to wait with the extraction until some later time.

Two weeks after the iridectomy I made an incision downwards in the periphery of the cornea. The patient lay on the operating table with hanging head. The foreign body was pretty steady in the upper middle part of the vitreous body and with focal illumination it could be seen after the anterior chamber was emptied as a gray body the size of a pin head. I entered the vitreous body with straight grooved forceps and succeeded at once to grasp the foreign body and to extract it with a very minute loss of vitreous body.

Soon after the extraction the eye became quiet and the patient gained one-third of normal vision. The foreign body was a small piece of stone.

Czermak begins his chapter on the extraction of non-magnetic foreign bodies with the words. "A hopeless chapter!" It may be very rare that it is possible to grasp the foreign body at the first attempt. In my case it was possible and thus a greater injury to the vitreous body in hunting for the foreign body and its consequent shrinkage and atrophy of the eyeball were thus prevented. Not only the eye but a considerable amount of vision was saved. The number of the operations was great, but the result is good.

2. *Two perforating wounds. Large prolapse of vitreous body. Six eyelashes in the anterior chamber. Rupture of the lens capsule, which is not followed by total traumatic cataract. Healing with one-fifth of normal vision.*

The second patient was injured in a tin plate manufactory. A piece of tin entered the right eye. He was brought to my clinic on the day of the injury.

The condition of the eye was the following: I found two perforating wounds in the cornea. One was close to the lower corneal periphery and entered the anterior chamber through the sclerotic. The iris was caught slightly in this wound. The sec-

ond was somewhat nasally from the first one and went through the sclerotic into the vitreous body. It was filled with choroid and a large vitreous prolapse. The anterior chanmber was not empty, the aqueous was turbid. In the turbid aqueous an oval mass of exudation was plainly visible.

I at once cut off the iris prolapse and tried to free the incarcerated limbs of the iris. Since I thought there might be a foreign body hidden behind the mass of exudation I extracted it with iris forceps. I found that this mass consisted of a bundle of eyelashes surrounded by exudation. The piece of tin must have cut a number of eyelashes from the lower lid and driven them into the anterior chamber. After the anterior chamber was emptied a rupture in the anterior lens capsule became visible, which on account of the turbidity of the aqueous could not be seen previously. The iris prolapse in the other wound was also cut off. I then brought some iodoform into the anterior chamber and thickly strewed the wounds with it. Then I stitched the conjunctiva over the wound with the vitreous prolapse.

The eye had only light perception and projection. The tension was greatly reduced. On account of the dimness of the vitreous body the interior of the eye could not be examined. From these conditions I thought the eye was probably lost, at least as an organ of vision. The danger of sympathetic ophthalmia was also present. Yet, one and a half months later all signs of irritation had disappeared. The vitreous body had cleared up sufficiently to get at least a dim vision of the fundus.

As I stated, there was also a rupture in the anterior lens capsule. I naturally expected the aqueous humor to enter the lens and cause a traumatic cataract. As in some rare cases, this did not occur in our case. The wound in the capsule healed with only a local partial opacity.

When discharged the patient with the correcting cylindrical lenses had 1/7 visual acuity. The pupil was dislocated downwards and in the lower part of the pupil lay the lens opacity. In order to relieve the strong pull on the iris and to give the patient a better pupillary area I made an iridectomy upwards about 2½ months later. Vision rose from 1/7 to 1/5.

3. Blepharotomy in conjunctivitis eczematosa.

I want to present two more cases in which I want to draw especial attention to the operation which of late I have practiced with preference. I mean blepharotomy, that is the cutting of the outer canthus in cases of phlyctaenular conjunctivitis.

Last year I published a preliminary notice on this operation in the *Medizinische Klinik*. My experience with this operation is now greatly enlarged. I have performed it in a large number of cases and can be only content with the results. The cases in which I operated had had repeated relapses under the ordinary conservative treatment. This conservative treatment given by some of the most renowned colleagues had given no lasting result. Blepharotomy changed everything in from 8 to 10 days. In this time the infiltrations, ulcers, phlyctenules, etc., healed perfectly. Of course, in scrophulous children general treatment was continued even after the cornea and conjunctivæ were healed. I have performed blepharotomy in the severest cases of conjunctivitis eczematosa among which I count the fascicular keratitis and the result was just as prompt in these cases. Formerly I always cauterized these cases of fascicular keratitis. In two cases after having made blepharotomy I refrained from using this agent in order to see whether the progressing ulcers would come to a stop. This occurred with blepharotomy alone.

From my experience I recommend blepharotomy in all relapsing cases of eczematous conjunctivitis in which the conservative treatment does not succeed. Blepharotomy acts by relaxing the eyelids so that they can no longer exert an unfavorable influence upon the circulation of the cornea and conjunctiva. When we consider how greatly swollen in many cases are the eyelids and that often there is a more or less pronounced blepharospasmus, we can easily understand how beneficial must be the action of cutting the outer commissure of the eyelids. Pressure on the eyeball ceases, the circulation of the lymph and blood is improved and the phlyctenules and ulcers heal under these more favorable nutritive conditions.

As you know, a very great many children suffer from eczematous conjunctivitis. The scars following the ulcers reduce their vision. Every relapse brings new dangers to vision. If, therefore, there is a remedy to cure the disease more promptly in these relapsing cases, we should surely welcome it.

Blepharotomy is a simple and safe operation which has no cosmetic drawbacks.

ABSTRACTS FROM MEDICAL LITERATURE.

THE TREATMENT OF THE EYE, WHEN THE GLOBE IS INFECTED, WITH THE OBJECT OF PREVENTING PANOPHTHALMITIS.

A. E. Davis (*Trans. Am. Oph. Soc.*, 1909) reports a number of cases in which the globe was infected where the injection of a solution of argyrol into the anterior chamber seemed to be of material assistance in preventing panophthalmitis. He offers the following conclusions:

1. In the treatment of infective processes of the eye, especially in those due to traumatism, perforating wounds, post-operative infection, etc., the well-established methods of treatment, medical and surgical, must yet hold a prominent place in the attempt to relieve these desperate conditions.
2. Argyrol, in solutions from 2 to 30 per cent., may be safely injected into the anterior chamber, and seems to be of marked value in arresting virulently infective processes, such as hypopyon keratitis, iritis, wound infections, and post-operative infections.
3. Serum and vaccine therapy have proved of benefit in certain infective processes, but in the more virulent forms they should not be relied upon exclusively, especially in the deep infections of the eyes and where the vitreous is involved.
4. A combination of medicinal, surgical, and serum therapy, holds out the best hope for recovery in the most serious cases, and all three should be tried when available.

THERAPEUTIC VALUE OF DIAPHORESIS IN TREATMENT OF OCULAR DISEASES.

A. Brav (*American Medicine*, February, 1910) believes that diaphoresis is of value in the treatment of ocular diseases for the following reasons:

- (1) It enhances and readjusts the metabolic end-products and eliminates the deleterious toxic substances from the organism;
- (2) it tends to re-establish the equilibrium in the general circulation, removing all possible venous stasis, and purifies the blood itself by the elimination of circulating toxins, following the stimulation of the sweat glands and the direct effect on the vascular system;
- (3) it invigorates the peripheral and central nervous system, thus increasing the nutrition of the ocular tissue affected;
- (4) it acts on the lymphatics, stimulating absorption and

thus carrying off the inflammatory products of the diseased part of the eye; (5) the local stimulating effect of moist heat is very important to the tissues in inflammatory processes.

PROGNOSIS OF DIABETIC CATARACT.

F. de Lapersonne (*Presse Médicale*, Feb. 5, 1910) states that, since diabetes modifies the tissues, making them more liable to infection and prolonging healing, the general condition of the patient should be improved as much as possible before operating for cataract. He has seen the wound reopened five weeks after it had apparently healed. Other complications which he has seen following cataract extraction in diabetics are hypostatic pneumonia, and postoperative psychoses. These complications are especially liable to happen in diabetics who usually combine the baneful factors of age, autointoxication and atony of the intestines. In one of his patients some time after the operation neurasthenia developed, accompanied by transient delirium, and the patient, refusing to adhere to diabetic regulations, died in diabetic coma. While these complications do occur, they are, however, rare and as a rule excellent results are obtained with proper care. It is important to study these patients carefully and it usually is wise to perform a preliminary iridectomy, redoubling the precautions at the time of operation and afterward.

OPTIC NEURITIS, CHOKED DISC, OR PAPILLÖDEMA.

Sir Victor Horsley (*Brit. Med. Jour.*, March 5, 1910) states that, in cases of increased intracranial tension, the greatest intensity and age of optic neuritis, or papillöedema, is of the highest importance in localizing the lesion and is on the same side as the maximal pressure effects of the lesion. Papillöedema caused by intracranial pressure begins at the upper border of the optic papilla and invades last the inferior temporal quadrant. He agrees with Mr. Gunn that the macular figure is produced by tension lines centered at the fovea, the most stress being just beneath the intima. The phagocytes of the retina consist of wander-cells, connective tissue corpuscles, epithelioid corpuscles of the nerve fiber layer and epithelioid corpuscles of the outer granular layer. The two latter kinds are in close relation to the supporting fibres of Müller.

A CASE OF DISEASE OF THE HYPOPHYSIS.

F. W. Marlow (*N. Y. Med. Jr.*, April 16, 1910), after reviewing briefly the anatomy, physiology and symptoms of disease of the hypophysis, reports a case of disease of this organ in which the vision, which had been greatly impaired in both eyes, was markedly improved in the right eye by the administration of thyreoid extract in five grain doses twice daily. Previous to the time when thyreoid extract was given the patient had been given potassium iodid, alternating with mercury and arsenic. Under that treatment the vision had gradually become worse. When the thyreoid treatment was begun the vision of the right eye was 6/18+ with loss of color perception in the temporal half of the field and at times white objects could not be seen in the lower temporal quadrant. There was complete temporal hemianopia in the left eye, including central vision. The author's notes of condition while thyreoid was being given follow:

April 20th.—Vision, right eye, 6/18+. Patient was still thirsty, appetite normal; hands numb on waking; pulse 72. On this date she commenced taking thyreoid extract.

April 27th.—A little heaviness of the head; thought vision worse>equals 6/18—1; pulse 96. The dose of thyreoid was reduced from ten grains to five.

May 4th.—Vision 6/12—1+2. Pulse 92.

June 8th.—Vision 6/9—.

In November her vision had risen to 6/9+4. The patient continued taking the thyreoid extract and vision remained at this point until her recent visit, when it had fallen slightly—to 6/9—. The thirst, polyuria, and amenorrhœa continued. She had been growing stouter for some months; headache occurred very rarely; pulse still over 90; otherwise she felt perfectly well.

Although this definite improvement took place in her acuteness of vision, the fields remained limited to the same extent as before commencing thyreoid extract. The conclusion seemed unavoidable that the improvement in vision was due to some local change produced by the administration of thyreoid extract.

REVIEWS.

ENCYCLOPEDIE FRANÇAISE D'OPHTALMOLOGIE. By F. Lagrange and E. Valude. Volume IX. Surgical technique. On ophthalmic geography. Veterinary and comparative ophthalmology. Ocular hygiene. Simulation. Legal medicine. Deontology. Military service examination of vision. General index. Paris, 1910. Octave Doin et Fils.

This is the last volume of the extensive work on ophthalmology written by French oculists to which we have gladly and forcibly drawn the attention of our readers in previous issues. The last volume is replete with the excellent work of men whose names are well known. It is hardly fair to point out one article as superior to the others, yet we are especially pleased with the extensive article by Valude on the surgical technique.

The work as a whole is a lasting monument to its editors and their collaborators giving, as it does, a complete review of modern French ophthalmology expounded by some of the best minds of their day.

DISEASES OF THE EYE. A Handbook of Ophthalmic Practice for Students and Practitioners. By G. E. de Schweinitz, M.D. With 351 illustrations and 7 chromo-lithographic plates. 6th edition, thoroughly revised. Philadelphia and London, 1910. W. B. Saunders & Co.

De Schweinitz's Handbook on Ophthalmology has for years been one of the best known and most popular of the now so numerous text-books on eye diseases and their treatment. This in itself is high praise. The sixth edition has been thoroughly brought up to date and a number of new articles appear in it which render it more valuable even than its predecessors and thus its field of usefulness has again been enlarged. It is sure to meet with the appreciation of the profession.

PHYSIOLOGY AND PATHOLOGY OF THE SEMICIRCULAR CANALS. Being an excerpt of the clinical studies of Dr. Robert Barany with notes and addenda gathered from the Vienna clinics. By A. E. Ibershoff, M.D., and a Foreword by R. S. Copeland, M.D. Paul B. Hoeber, New York, 1910. Price \$1.00.

This monograph deals especially with the aid which nystagmus, formerly considered to be purely an optical or cerebral symptom, gives to the aurist in making a differential diagnosis. The description is short and clear and the little book will be of great value to the practitioner and student. ALT.